0051672

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc. 3350 George Washington Way Richland, WA 99352

July 2, 1999

SAF Number

Attention: Joan Kessner

: C99-073

Date First Sample Received: June 23, 1999

Number of Samples : One Sample Type : Water SDG Number : W02815

Data Deliverable : 45 Day Summary

JUL 1999 GALES IN STATE OF THE PROPERTY OF THE

I. Introduction

On June 23, 1999, one water sample was received by the Quanterra Environmental Services Richland Laboratory (QESRL) for chemical analysis. Upon receipt, the sample was assigned the following laboratory ID number to correspond with the Bechtel Hanford, Inc. (BHI) specific ID:

QESRL ID#
9CX8J410BHI ID#
BOVNF3MATRIX
WaterDATE OF RECEIPT
6/23/99

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information; analytical results and the appropriate associated statistical errors.

The requested analysis was: Hexavalent Chromium

Hexavalent Chromium by EPA7196

III. Quality Control



Bechtel Hanford, Inc. July 2, 1999 Page 2

The analytical results for the analysis include a minimum of one Laboratory Control Sample (LCS), one matrix spike (MS), one matrix spike duplicate (MSD), and one method (reagent) blank. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in the same units as sample results.

IV. Comments

Hexavalent Chromium

Hexavalent Chromium by EPA7196

The LCS, MS, MSD, batch blank, and sample results are within the requirements of the contract.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

0003



SAMPLE RESULTS

LAB NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W02815 / 8083

LAB SAMPLE ID:

9CX8J410

MATRIX:

WATER

CLIENT ID:

B0VNF3

DATE RECEIVED:

6/23/99 12:26:00 PM

| ANALYTE | RESULT | Q | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA/IDL | REPORT UNIT | YIELD | METHOD NUMBER | |
|-----------|----------|---|------------------------|---------------------|----------|----------------|-------|------------------|---|
| HEXCHROME | 6.00E-03 | | N/A | N/A | 2.00E-03 | mg/L | N/A | EPA7196 | _ |

Number of Results: 1

J = No U qualifier and result <



DUPLICATE RESULTS

LAB NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W02815 / 8083

LAB SAMPLE ID:

CX8J414R

MATRIX:

WATER

CLIENT ID:

B0VNF3

DATE RECEIVED:

6/23/99 12:26:00 P

ORIG LAB SAMPLE ID: 9CX8J410

| ANALYTE | DUP RESULT Q | COUNTING ERROR (2 s) | TOTAL ERROR (2 s) | | REPORT UNIT | YIELD | METHOD NUMBER | ORIG RESULT | RPD |
|-----------|-----------------|--------------------------|-----------------------|----------|----------------|-------|------------------|----------------|--------|
| HEXCHROME | 7.00E-03 | N/A | N/A | 2.00E-03 | 3 mg/L | N/A | EPA7196 | 6.00E-03 | 15.38% |



BLANK RESULTS

LAB NAME:

QUANTERRA, Richland

SDG /RPT GRP:

W02815 / 8083

LAB SAMPLE ID:

CX8VD11B

MATRIX:

WATER

| ANALYTE | RESULT | Q | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA/IDL | REPORT UNIT | YIELD | METHOD NUMBER | |
|-----------|----------|---|------------------------|---------------------|----------|----------------|-------|------------------|--|
| HEXCHROME | 0.00E+00 | Ü | N/A | N/A | 2.00E-03 | mg/L | N/A | EPA7196 | |



LABORATORY CONTROL SAMPLE

LAB NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W02815 / 8083

LAB SAMPLE ID:

CX8VD12S

MATRIX:

WATER

| ANALYTE | RESULT | COUNTING Q ERROR (2 s) | TOTAL ERROR (2 s) | MDA/ | REPORT UNIT | YIELD | EXPECTED | RECOVERY |
|-----------|----------|---------------------------|----------------------|----------|----------------|-------|----------|----------|
| HEXCHROME | 4.97E-01 | N/A | N/A | 2.00E-03 | mg/L | N/A | 5.00E-01 | 99.40% |



MATRIX SPIKE RESULTS

LAB NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W02815 / 8083

LAB SAMPLE ID:

CX8J412W

MATRIX:

WATER

| ANALYTE | SPIKE RESULT* Q | COUNTING ERROR (2 s) | TOTAL ERROR (2s |) MDA/IDL | REPORT UNIT | SAMPLE RESULT | EXPECTED | RECOVERY |
|-----------|--------------------|-------------------------|--------------------|-----------|----------------|------------------|----------|----------|
| HEXCHROME | 5.28E-01 | N/A | N/A | 2.00E-03 | mg/L | 6.00E-03 | 5.26E-01 | 100.38% |



MATRIX SPIKE RESULTS

LAB NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W02815 / 8083

LAB SAMPLE ID:

CX8J413W

MATRIX:

WATER

| ANALYTE | SPIKE RESULT* Q | COUNTING ERROR (2s) | TOTAL ERROR (2s) | | REPORT UNIT | | EXPECTED | RECOVERY |
|-----------|--------------------|------------------------|---------------------|----------|----------------|----------|----------|----------|
| HEXCHROME | 5.29E-01 | N/A | N/A | 2.00E-03 | mg/L | 6.00E-03 | 5.26E-01 | 100.57% |



Richland Laboratory Data Review Check List METALS

| Work Order Number(s): CX8J4101 ac Batch | _91- | 74/3 | 40 | |
|---|------------|-----------|------------|-------------------------------------|
| Lab Sample Numbers or SDG: WO 2815 | | | | |
| Method/Test/Parameter: CR+6 in water RICHW | CDD 3 | 3 R | 3 | |
| Review Item | Yes (*) | No (✓) | N/A (✓) | 2 nd Level Review (✓) |
| A. Initial Calibration | | | | |
| 1. Performed at required frequency wih required number of levels? | | | | |
| 2. Correlation coefficient within QC limits? | | | | |
| Initial calibration verification (ICV) analyzed immediately after calibration and results within QC limits? | | | | |
| 4. Initial calibration blank(IC3) analyzed immediately after ICV and concentrations of all parameters ≤ reporting limit? | | | | |
| B. Continuing Calibration | | _ | | |
| 1. CCV analyzed at required frequency and all parameters within QC limits? | | | i | |
| 2. CCB analyzed at required frequency and all results ≤ reporting limit? | | _ | | |
| C. Sample Analysis | | | | |
| 1. Were any samples with concentrations above the linear range for any parameter diluted and reanalyzed? | | | | |
| 2. Were all sample holding times met? | | | | |
| D. QC Samples | | _ | | |
| All results for the preparation blank below limits? | | | | |
| 2. MS or MS/MSD recoveries within QC limits and %RPD (for MSD) acceptable? | | | İ | |
| 3. LCS percent recovery within QC limits and %RPD (for LCSD) acceptable? | | | | |
| 4. Analytical spikes within QC limits where applicable? | | | | <u>-</u> |
| 5. ICP only: One serial dilution performed per SDG? | | | | |
| 6. ICP only: CRDL standard (CRI or CRA) analyzed at required frequency? | | | | |
| 7. ICP only: Interference check samples (ICSA, ICSAB) and HICAL analyzed at the required frequencies and within QC limits? | | | | |

| (Y | | No (√) | N/A | 2 ^m Level Review (✓) |
|-----|-------------|--------------------|-----|------------------------------------|
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| ~ | 7 | | | |
| V | 1 | | | |
| V | 7 | | | |
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| Date: | 6-24-99 |
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| ~~~. | |

Second-Level Review:

Date:

Form No. CG-191, Rev. 2, 1/97

CHAIN OF CUSTODY FORMS

| Bechtel Hanford | Inc. | Cl | HAIN OF CUST | FODY/S | AMPLI | E ANALY | YSIS] | REQUEST | ŗ | В | 99-073-02 | Page <u>1</u> o | of j |
|---|------------------------|-------------|---|---|---------------|--|------------|----------------------------------|-----------|------------------|----------------|---|------|
| Collector Doug Bowers/Renee Neilson | | | any Contact ik Corpuz | Telepho 373-1 | ne No. 661 | | | Project Coordi TRENT, SJ | nator | Price Code | 7L | Data Turn | ıaro |
| Project Designation Borehole Drilling at 116-DR | | Sampl | ing Location -DR 1&2 | | | | | SAF No. B99-073 | | , | | 21 D |)a |
| Ice Chest No. | | Field 1 | Logbook No. | <u>-</u> | | × **** | <u>l</u> | Method of Ship | | | | | |
| Shipped To | | | Property No. | 1 | | | | GOV vehicle Bill of Lading/ | | No | | | |
| Quanterra Incorporated | | | | 117 | | | | | <u> N</u> | (A) | | | |
| | | | | _ | | | | COA RI | 60R | -1N6W | 0 | | |
| POSSIBLE SAMPLE HAZA | RDS/REMARKS | | Preservation | Cool 4C | | | | | | | | | |
| | | } | Type of Container | P | | | | | | | 1 | | |
| | | • | No. of Container(s) | 1 | | | | | | | | | |
| Special Handling and/or Stor | age | | Volume | 500mL | | | | | | | | | |
| SDL | SAMPLE AN | Due | 7-14 | Chromium Hex - 7196 | | | | | | | · | | |
| SDG W07815 | SAMI LE AN | J9F231 |)202 | | | | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | 3/4/2015 | 1000 | 100 | (Artista | | S. 7 × | | | | |
| BOUNF3 | water | 6-23-99 | 0835 | X | ļ | | | | | <u>.</u> | | | |
| ('X 8J4 | | | | | | | | | | | | | |
| | | | | ļ | | <u> </u> | | | | _ | | | |
| | | | | | | | | | | | | | |
| CHAIN OF POSSESSION | | Sign/Pri | | | ** A | CIAL INSTRU Ill samples reque pur holding time i | sting Cr (| VI) must be direct | ed to QES | -Richland in ord | er to meet the | Matrix * | |
| Reinquished By Reinquished By | NICON 6-2 Date/Time | Received By | nAH.sily | ntc/Time / 2 (L. C. C. Z.) gre/Time | 749 Sa -h | mple is | 5 t | 1) in water. 1) be fil 613 | Her | ed pr | rior | Water Vapor Other Solid Other Liquid | |
| Relinquished By | Date/Time | Received By | D | ate/Time | \Box | W IU | ny | ノ | | | | | |
| Retinquished By | Date/Time | Received By | | ate/Time | | | | | | | | | |
| LABORATORY Received By SECTION | | | , , , , , , , , , , , , , , , , , , , | Ti | lle | | | | | | Di | ate/Time | |
| FINAL SAMPLE Disposal M DISPOSITION | boilts | | | | | Dispose | ed By | | | | D: | ate/Time | |

Job No. 22192
Writing Response Reprint
CCN: N/A
OU: N/A
TSD: N/A
ERA: N/A
Satjust Codet 5230

| TO: | W. S. Thompson G. C. Henckel | N1-28 H4-80 | DATE: | February 29, 1996 | |
|---------|--|-------------------------|-------|--|--|
| COPIES: | K. A. Smith T. L. Lafreniere D. E. Gergely | X0-23 X0-23 X0-23 | FROMs | S. K. De Mers (Radiological Controls T7-05/373-1913 | |

SUBJECT: Total Activities for Off-Site Shipments of Groundwater Samples to NRC Licensed Laboratories

There is no need to perform total activities prior to offsite shipment to NRC licensed labs of samples taken from ground water wells located on the Hanford Site.

All wells reviewed to date for radiological content have shown no well with a total activity in excess of 2,000,000 pCi/I (2,000 pCi/gm), the Department Of Transportation limit for radioactive material. The highest activity in any known well is 1.56 X 10° pCi/I H³.

While this does not constitute any release from radiological controls for worker protection, it does allow samples to be shipped based on historical laboratory data and save the expense of doing radiochemical analysis.

A copy of the most recent analytical data should be provided to the NRC licensed laboratory with the samples being shipped or if no data is available for new wells, the most recent data from adjacent wells.

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Figure 1

| | SAMPLE CHECK-IN LIST | 0 | | | | | | |
|--|---|---------------|--|--|--|--|--|--|
| Date/Time Received: 623991226 sg#: W02815 | | | | | | | | |
| Work Order Number: 9F230202 SAF #: 899-073 - | | | | | | | | |
| Shipping Container ID: 009 Chain of Custody # 099-073-02 | | | | | | | | |
| 1. | Custody Seals on shipping container intact? | Yes [] No [] | | | | | | |
| 2. | Custody Seals dated and signed? | Yes [] No [] | | | | | | |
| 3. | Chain-of-Custody record present? | Yes [] No [] | | | | | | |
| 4. | Cooler temperature | | | | | | | |
| 5. | Vermiculite/packing materials is | Wet [] Dry [] | | | | | | |
| 6. | Number of samples in shipping container: | | | | | | | |
| 7. | Sample holding times exceeded? | Yes [] No [] | | | | | | |
| 8. | Samples have: | | | | | | | |
| 9. | Samples are: | | | | | | | |
| 10. | Where any anomalies identified in sample receipt? Yes [] No | 14 | | | | | | |
| 11. | Description of anomalies (include sample numbers): | <u> </u> | | | | | | |
| | • | | | | | | | |
| | J. J | 6-12-49 | | | | | | |
| Sample Custodian/Laboratory: 1. Alther Bate: 6 70 7/ | | | | | | | | |
| Telephoned To:OnBy | | | | | | | | |

Client Sample Screening Results

25-Jun-99



| CLIENT CODE ID MATRIX RECEIVED | DETECTOR | ACQ DATE | SAMPLE | | UTES C | | ГСРМА С | NTS B | NET CPM B |
|---|--------------------|--------------------|--------------|-----------|--------|-----------|------------------|-------------|---------------------|
| BHI B0M4M3 6/25/99 9:29:00 AM | | 6/25/99 2:30:25 PM | | | 30 | 15 | 0.385 | 576 | 18.03125 |
| CX9MM LIQUID | Bkg: | 6/25/99 4:27:44 AM | BKG | | 800 | 92 | 0.115 | 935 | 1.16875 |
| Anl Date: 6/25/99 Tot Sa, Alq: 5.00E-01 | , 1.00E+01 | Alp; (Dpm/ 5.1 | 8E-01 (uCi/ | 1.17E-05 | (pCi/ | 2.33E+01 | ± 2.3E+01 | | 1.1E+00 Lal |
| Ppt mg: 1.6 Units: L | , ml | Bet; Alq): 3.3 | 4E+01 Sa): | 7.53E-04 | L g): | 1.51E+03 | <u>+</u> 6.7E+01 | 1 / | 3.3E-02 Ale L ; |
| BHI B0M4M4 6/25/99 9:29:00 AM | QUAD22D | 6/25/99 2:30:25 PM | B0M4M4 | | 30 | 6 | 0.12125 | 151 | 3.86583333 |
| CX9N0 LIQUID | Bkg: | 6/25/99 4:27:44 AM | BKG | | 800 | 63 | 0.07875 | 934 | 1.1675 |
| Anl Date: 6/25/99 Tot Sa, Alq: 5.00E-01 | , 1.00E+01 | | | | | | | | 2.4E+00 Lal |
| Ppt mg: 0.5 / Units: L | , mt | Bet; Alq): 7.1 | 8E+00 Sa): | 1.62E-04 | L g): | 3.23E+02 | ± 3.5E+01 | 1/ | 1.5E-01 Ald |
| BHI B0VNF3 6/25/99 9:29:00 AM | QUAD23A | 6/25/99 2:30:26 PM | B0VNF3 | | 30 | 2 -0. | 01083333 | 36 | 0.1975 |
| CX8J4 LIQUID | Bkg: | 6/25/99 4:27:57 AM | BKG | | 800 | 62 | 0.0775 | 802 | 1.0025 |
| Ani Date: 6/25/99 Tot Sa, Alq: 5.00E-01 | , 1.00E+01 | Alp; (Dpm/ -3.0 | 61E-02 (uCi/ | -8.13E-07 | (pCi/ | -1.63E+00 | ± 1.9E+01 | CAT | 5.0E-01 Lat |
| Ppt mg: 1.6 Units: L | , mi | Bet; Alq): 3.8 | 1E-01 Sa): | 8.57E-06 | L g): | 1.71E+01 | ± 1.8E+01 | 1/ | 2.9E+00 Alq L g |
| BHI B0VPM7 6/25/99 9:29:00 AM | QUAD23B | 6/25/99 2:30:26 PM | B0VPM7 | | 30 | 16 0.3 | 97083333 | 130 | 3.29458333 |
| CX8MM SOIL | Bkg: | 6/25/99 4:27:57 AM | BKG | | 800 | 109 | 0.13625 | 831 | 1.03875 |
| Anl Date: 6/25/99 Tot Sa, Alq: 8.00E+01 / | , 9.35E+01 | Alp; (Dpm/ 2.4 | 5E+00 (uCi/ | 9.43E-04 | (pCi/ | 1.18E+01 | + 5.8E+00 | CAT | _4.2E+00 Lab |
| Ppt mg: 93.5 Units: g | , mg | Bet; Alq): 6.98 | 8E+00 Sa): | 2.69E-03 | L g): | 3.36E+01 | ± 4.0E+00 | 1 / | 3.0E+00 Alq L g |
| BHI B0VPM8 6/25/99 9:29:00 AM | QUAD23C | 6/25/99 2:30:26 PM | B0VPM8 | | 30 | 17 0.42 | 29166667 | 134 | 3.42916667 |
| CX8N0 SOIL | Bkg: | 6/25/99 4:27:57 AM | BKG | | 800 | 110 | 0.1375 | 830 | 1.0375 |
| Ani Date: 6/25/99 Tot Sa, Alq: 8.00E+01 | , 9.11E+01 | Alp; (Dpm/ 2.6) | 1E+00 (uCi/ | 1.0313-03 | (pCi/ | 1.29E+01 | ± 6.0E+00 | CAT | 3.9E+00 Lab |
| Ppt mg: 91.1 Units: g | , mg | Bet; Alq): 7.17 | 7E+00 Sa): | 2.84E-03 | L g): | 3.55E+01 | ± 4.1E+00 | 1 / | 2.8E+00 Alq L g |
| BHI B0VPM9 6/25/99 9:29:00 AM | 6/25/99 2:30:26 PM | В0УРМ9 | | 30 | 7 0.17 | 4583333 | 129 | 3.30375 | |
| CX8N2 SOIL | Bkg: | 6/25/99 4:27:57 AM | BKG | | 800 | 47 | 0.05875 | 7 97 | 0.99625 |
| Ani Date: 6/25/99 Tot Sa, Alq: 8.00E+01 | , 9.29E+01 | Alp; (Dpm/ 9.35 | 5E-01 (uCi/ | 3.63E-04 | (pCi/ | 4.53E+00 | ± 5.0E+00 | CAT | 1.1E+01 Lab |
| Ppt mg: 92.9 Units: g | , mg | Bet; Alq): 7.03 | 3E+00 Sa): | 2.73E-03 | L[g]: | 3.41E+01 | ± 4.0E+00 | 1 | /2.9E+00 Alq L g |



COC Signature Page

| Batch #: 9174340 | Initials/Date | Procedure # |
|------------------|---------------|-----------------|
| Released By | KA 6-23-99 | Bichneous |
| Received | B 6-23-99 | RICHWC 5003 R.3 |
| Released By | B) 6-24-99 | n/a |
| Received | | - |
| Released By | | n/a |
| Received | | |
| Released By | * | n/a |
| Received | | |
| Released By | | n/a |
| Received | | |
| Released By | | n/a |
| Received | | |
| Released By | | п/а |
| Received | | |

RC-131, Rev.0, 8/98

RQC050

Quanterra Incorporated WET CHEM BATCHSHEET Richland

Run Date: 6/23/99 Time: 15:51:12

PRODUCTION FIGURES - WET CHEM

| | SAMPLE NUMBER | QC | RE-R MATR | | | | -RU IER | | MISC NUMBI | <u>er</u> | TOT# | | | NDED VERABLE |
|---|------------------|------------|--------------|-------------|----|-----|------------|--------------------|---------------|--------------|------|-----------------|-----|-----------------|
| METHOD: QC BATCH PREP DATE USER: | #: 91743 | /99 | Chromi | um | _ | | PI | ALS: REP NAL | | | I | CA ENT NITIA | | |
| Work Order | Lab Nu | mber | | Stri Ana | | ure | | Exp. | Ana I | lysis ate | | ample | ID: | · |
| CX8VD-1-01 | J-9F23 | 0000-340- | в хх | I | 88 | EA | 51 | | · | | _ I | NTRA- | LAB | BLANK |
| CX8VD-1-02 | J-9F23 | 0000-340- | с хх | I 8 | 88 | EΑ | 51 | | | | _ I | NTRA- | LAB | CHECK |
| CX8J4-1-01 | J-9F23 | 0202-001 | · xx | I 8 | 88 | EΑ | 51 | | · | | В | 0VNF3 | | |
| CX8J4-1-03 | J-9F23 | 0202-001-1 | D XX | Ι 8 | 88 | EΑ | 51 | | | | _ В | 0VNF3 | | |
| CX8J4-1-02 | J-9F23 | 0202-001- | s xx | 1 8 | 38 | EΑ | 51 | | | | В | ovnf3 | | |
| CX8J4-1-04 | J-9F23 | 0202-001- | x xx | Ι 8 | 38 | EA | 51 | | | | В | 0VNF3 | DUP | |
| | | | Cor | itro | 1 | Lim | its | 3 | | | | | | |
| (85-115) | | | | | | | | | | | | | | |
| (85-115) | | | | | | | | | | | | | | |

(85-115)